



Sillenites Ltd.

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Photorefractive Semi-Insulating Gallium Arsenide Monocrystals (SI – GaAs)



Specifications

1. Crystal material: optical grade Czochralski grown monocrystal, GaAs
2. Dimensions: up to 20X20X20 mm
3. Crystallographic orientation: cut – 110
4. Cutting of blanks: fine cut, M40 – M60
5. Polishing of cubes: laser grade
 - 5.1 polished sides: two, four or six sides
 - 5.2 flatness: less $\lambda/2$
 - 5.3 wedge: < 1 arc min
 - 5.4 clear aperture: $> 90\%$
6. Opto-electronic material properties of SI – GaAs crystal:
 - 6.1 type of conductivity: n-type
 - 6.2 mobility: $3 \cdot 10^3$ cm/sec
 - 6.3 resistivity: 10^7 Ohms * cm, semi – insulating, SI – GaAs
7. Linear electro-optical constants at 1.0 mkm: $r_{41} = 1.2$ pm/V, $n^3 r_{41} = 56$, $d = 12$
8. Optical, electro-optical and holographic parameters of SI – GaAs in comparison with sillenite crystals $\text{Bi}_{12}\text{SiO}_{20}$ (BSO), $\text{Bi}_{12}\text{GeO}_{20}$ (BGO)

Crystal	Point Group	Dielectric constant, ϵ_0	EO coef., pm/V	Holographic sensitivity, S, cm^2/J	Max Gain factor, cm^{-1}
SI – GaAs	43m cubic	12	1.2 at 1 μm	10^4 at 1.06 μm	6 – 7
BSO undoped	23 cubic	56	5 633 nm	400-500 at 532 nm	~ 10
BGO undoped	23 cubic	40	3.5 633 nm	400-500 at 532 nm	~ 9

Standard SI – GaAs cubes from stock: cut – 110, six sides polished, 5X5X5mm

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